



Monitoring, Evaluation, and Adaptive Management Framework Pilot Pot Limit Program Draft Prospective

The California Dungeness crab task force (DCTF) sent reports on January 15 and March 31, 2010 to the California Legislature requesting a three-year statewide pilot pot limit program for the commercial Dungeness crab fishery. This document outlines key elements to consider in the development of a robust, yet cost-effective program for monitoring, evaluation, and adaptive management of the Dungeness crab pilot pot limit program. This document is a framework and is not intended to provide a comprehensive monitoring plan. Instead, the framework presents draft goals of a pot limit program, key informational needs for monitoring, and finally, offers suggestions on how this framework could be effectively implemented to allow for adaptive management of the program and ensure the goals of the program be met.

Pot Limit Program Goals

Pot limit programs are generally used to decrease and/or maintain the amount of gear used in each fishing season with the intent of avoiding increases in fishing capacity and encouraging increased efficiency.¹ Pot limits are a specific form of gear restriction that regulates the number of pots that are allowed to be deployed or used at any given time.

At their February 18, 2010 meeting in Ukiah, the DCTF suggested including a pilot pot limit program into the California Dungeness crab management recommendations to decision-makers.²

The DCTF reached general agreement on the following three goals³ of a pot limit program:

- Cap and reduce the existing capacity of the commercial fishery by regulating the amount of gear used in the fishery⁴
- Ensure the economic sustainability of the fishery
- Use the program to inform future management of the fishery

¹ FAO. 1997. "FAO Technical Guidelines for Responsible Fisheries."

http://books.google.com/books?id=O22nsS6TUvcC&pg=PA47&lpg=PA47&dq=fisheries+management+gear+restrictions&source=bl&ots=iwRkaXSn9z&sig=sxsA4YNvsKD50530go0l66ZhNz0&hl=en&ei=qN9oSo7iBtWOtgeoz3FCw&sa=X&oi=book_result&ct=result&resnum=1 Last visited July 7, 2009.

² DCTF January 15, 2010 report the Joint Committee on Fisheries and Aquaculture, the Department of Fish and Game, and the Fish and Game Commission.
http://www.opc.ca.gov/webmaster/ftp/project_pages/dctf/Final_DCTF_LegReport1.pdf Last visited January 31, 2010.

³ Note: While many other goals were proposed up by various DCTF members, these were the only three that received two-thirds agreement.

⁴ Note: Some fisheries managers and scientists believe that regulating the amount of gear used in the fishery may not limit actual fishing capacity and that there are various other types of management tools which may be more effective for this purpose. However, after examining other gear restriction program on the West Coast, the DCTF believes that limiting fishing gear may help lower fishing capacity in the commercial Dungeness crab fishery.

In order to assess the effectiveness and meet the goals of the pot limit program, data collection and analysis is essential. Following the three-year pilot period, the following questions will need to be answered to determine whether the goals of the program were met:

- How has the program affected the amount of gear used in the fishery? (e.g. increased, decreased, or maintained status quo)
- Has the pot program changed fishermen's catch? (i.e. Has catch increased, decreased, or maintained status quo?)
- Does the pot program affect the length of the Dungeness crab fishing season and help control catch flow? (i.e. Does the fishery still experience a derby whereby 80% of the season's catch is landed within the first 6 weeks of the fishery?)
- How has the pot program affected profits (i.e. revenue per unit of effort) for fishermen, receivers and processors? (i.e. Has net profitability increased, decreased, or maintained status quo?)
- Have there been regional shifts in catch, receiving, processing or profits?
- What is the fishing community's perception of the program? (e.g. Do commercial fishermen, sport fishermen, and processors like the program? Do they think the program is negatively or positively affecting their landings and profits? How has it affected relationships between fishermen and receivers/processors? Has the viability of fishing operations been affected?)
- Is the program administered effectively and efficiently?
- Are fishermen abiding by the regulations in the pilot region?
- How has the program affected participation in other fisheries?
- How has the program affected local support businesses that depend (in part or entirely) on the crab fishery?

Data Needs/Gaps

In order to assess whether the program's goals are being met and to answer the questions above, data must be collected and analyzed. Currently, efforts to collect data related to the Dungeness crab fishery are limited to landings tickets and permit information.

Available Data

Landings tickets and permit information are collected by the California Department of Fish and Game (DFG) and stored in their California Fisheries Informational System (CFIS) database. This data provides a historical time series of Dungeness crab landings (both by permit/vessel and for the entire fishery) and historical ex-vessel landing price information. This data can be used to answer some (but not all) of the questions listed above.

While the CFIS data will be useful in a Dungeness crab pot limit monitoring program, it is important to keep in mind that it is confounded by various factors:

- Permit transfers⁵
- Inclement weather

⁵ Note: When permits are transferred to new vessels, landings histories do not follow the permits. This could confuse the analysis of the program because it could show that a permit holder had no landings during the pilot program when in fact, the permit holder merely transferred the permit to a new owner thereby erasing the permit's landing history.

- Reporting technology
- Natural, cyclical fluctuations in the crab population
- Regulatory changes in this and other fisheries
- Changes in fishery relieving and processing infrastructure

For example, if the CFIS data were used to show that a permit holder's catch has decreased through the duration of the program, the decrease could not solely be attributed to the pot program. A number of factors including health issues, vessel operation problems, or the reduced availability of legal sized crab are among factors that may contribute to declines in vessel and/or fleet-wide landings. Conversely, many variables/circumstances could contribute to increases in individual or fleet-wide landings. In order to control for these variables and better explain the results of the program to determine if it is meeting its goals, more data is needed.

Data Gaps

A number of informational needs have been identified to answer the questions above including:

- The number of pots used before and after implementation
- Other related changes in fishing patterns
- Fishermen's (operating and fixed) costs before and after implementation⁶
- Stakeholder level of approval and feelings about the program

There is currently no entity collecting information on these items.

Suggestions: Development and Implementation of a Monitoring, Evaluation, and Adaptive Management Plan

Ideally, an effective monitoring, evaluation, and adaptive management plan would have all relevant data collected and readily available for analysis. Since there are a number of data gaps in the fishery and many informational needs for a monitoring plan, it is essential that the amount and types of data collected (as indicated above) be increased and specified. The following is a list of suggestions that could be included in the plan for the proposed pot limit program in California.

Adaptive Management:

- **Agree on and formalize goals and evaluation indicators for the pilot program:** Goals and criteria for measuring performance must be spelled out clearly.⁷ Scientific analysis, input and technical reviews will be needed to review methods of the plan, identify the best indicators to measure progress towards these goals and the feasibility of setting a benchmark or threshold that could

⁶ Note: There is some preliminary data on this subject already available in the following study:

Hackett, Steven, D. King, D. Hansen, and E. Price. 2009. *The Economic Structure of California's Commercial Fisheries*. Technical Report. California Department of Fish and Game, Sacramento.
<http://www.dfg.ca.gov/marine/economicstructure.asp> - It is not yet clear how much, if any, utility the data from this study can provide and whether or not agencies will use it to evaluate the pot limit program.

⁷ Federal Advisory Committee. June 2005. Protecting America's Marine Environment Areas. NOAA, U.S. Department of the Interior, Washington D.C.

trigger a change in policy or management during the pilot program as well as guidance for maintaining or expanding the pilot program beyond the three year trial period.

- **Develop a process and structure with stakeholders:** Once monitoring data has been compiled and analyzed, a committee structure is a common practice for including stakeholders in the adaptive management decision-making process. The more transparent and forthright the process is, the more effective it will be in gaining stakeholder support, and developing a sense of shared stewardship.

Monitoring and Evaluation:

- **Acquire a baseline pot count in California.** This would be used to determine whether or not the program is reducing the amount of gear in the water.
 - While a baseline pot count would be ideal, it would need to be conducted prior to the implementation of the pot limit program, which may not be feasible. If it is not feasible there are other methods to obtain a rough baseline pot count. (e.g. Through collaborations with gear retrieval programs)⁸
- **Amend DFG reporting methods** to require electronic reporting. This would allow for real-time data reporting and facilitate quicker, more cost-effective analysis of the three-year pot limit program. Additionally, adding this reporting requirement would require the data necessary for an economic analysis of the program to be collected. To increase the type and amount of data received by DFG on fish tickets, electronic reporting of fishermen's operating costs for each landing could also be required.
- **Increase data accessibility to both Dungeness crab fishery managers, fishery participants and other stakeholders.** This would facilitate the ease of data analysis to inform fishery management. Currently, Fish and Game Code section 8022 requires that DFG maintain data confidentiality. However, through mechanisms such as non-disclosure agreements, Memoranda of Understanding, amendments to the Fish and Game Code or mechanisms to ensure confidentiality each individual's data, this information could be more accessible to the California legislature, fishery managers, and stakeholders.
- **Collect data through surveys-** A survey could be used to gather data on commercial fishermen, receivers, and processor's costs before and after implementation as well as the satisfaction within the Dungeness crab industry with the pot limit program. Data on crew sizes, as well as gear and vessel maintenance, fuel, bait and other costs could be collected through a survey to determine whether and how the economics of the fishery have changed as a result of the program. Additionally, the survey should contain opinion questions to

⁸ For example, UC Davis's Sea Doc program (http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_1051-1100/sb_1093_bill_20100820_amended_asm_v93.pdf) may be a valuable tool.

ascertain the community's level of satisfaction with the pot limit program. While most of the above suggestions could be fulfilled by the legislature and DFG, a contractor could be hired to develop and implement a survey, and analyze the resulting data.

- **Data review procedures** should be established to evaluate the program. Data review can be performed by fishery managers but, may be better received by stakeholders if it was performed by a committee composed of scientists, fishermen, buyers, fishery managers, etc.